Name_____

Average Atomic Mass
Pre-AP

Complete the following problems. Show all work on a separate sheet of paper.

Average atomic mass = Σ(mass of isotope × relative abundance)

1. Nitrogen

mass number	exact weight	percent abundance
14	14.003074	99.63
15	15.000108	0.37

2. Chlorine

mass number	exact weight	percent abundance
35	34.968852	75.77
37	36.965903	24.23

3. Silicon

mass number	exact weight	percent abundance
28	27.976927	92.23
29	28.976495	4.67
30	29.973770	3.10

4. Magnesium

mass number	exact weight	percent abundance
24	23.985042	78.99
25	24.985837	10.00
26	25.982593	11.01

5. Molybdenum

mass number	exact weight	percent abundance
92	91.906808	14.84
94	93.905085	9.25
95	94.905840	15.92
96	95.904678	16.68
97	96.906020	9.55
98	97.905406	24.13
100	99.907477	9.63

6. Boron has an atomic mass of 10.81 amu according to the periodic table. However, no single atom of boron has a mass of 10.81 amu. How can you explain this difference?

7. Copper has two naturally occurring isotopes. Cu-63 has an atomic mass of 62.9296 amu and an abundance of 69.15%. What is the atomic mass of the second isotope? What is its nuclear symbol?

8. Thallium has two stable isotopes, ^{203}Tl and ^{205}Tl. Knowing that the atomic weight of thallium is 204.4amu, which isotope is the more abundant of the two?

9. Copper exists as two isotopes: ^{63}Cu (62.9298 amu) and ^{65}Cu (64.9278 amu). What are the percent abundances of the isotopes? (Hint use two equations with two variables, liner equations x and y, x + y = 100%)

10. Boron has an atomic mass of 10.810 amu. It consists of the isotopes ^{10}B with isotope mass of 10.013 and ^{11}B with an isotope mass of 11.009amu. What are the percentages of the two isotopes in naturally occurring boron?

11. Naturally occurring bromine consists of two isotopes: ^{79}Br, which has a mass of 78.91 amu and ^{81}Br, which has a mass of 80.916 amu. The average atomic mass of bromine is 79.904 amu. What is the percent abundance of each of the isotopes?

12. There are 2 isotopes of gallium that occur naturally; ^{69}Ga and ^{71}Ga. The ^{69}Ga atoms have a mass of 68.925581 amu and the ^{71}Ga atoms have a mass of 70.924707 amu. What is the percent natural abundance for each isotope?